SPAWAR Systems Center San Diego

Applications of AREPS

Current operational uses

- Airborne & surface-based radar probability of detection
- ESM vulnerability
- VHF/UHF communications assessment
- Strike & electronic countermeasures assessment
- Early warning aircraft stationing
- HF ground and sky-wave communication / radar assessment

Future operational uses

- Homeland defense
  Border patrol communications
- Satellite communications assessment
- GPS jamming vulnerability
- TBM probability of detection

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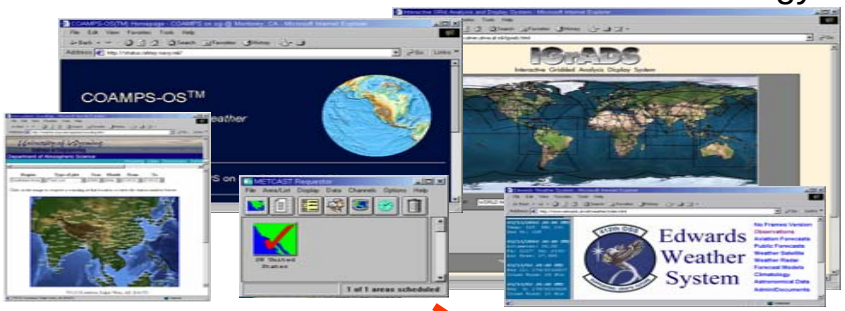
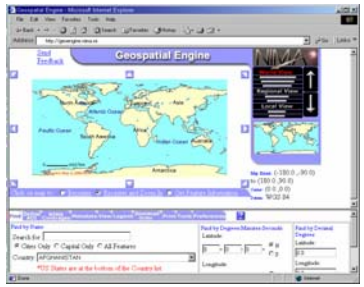
AREPS Windows® Personal Computer Implementation

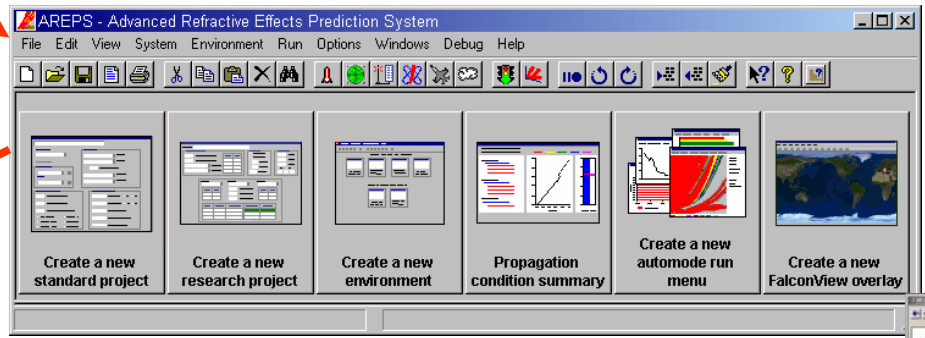
METOC in numerous formats
Observations / Mesoscale Models / Climatology



DTED Terrain

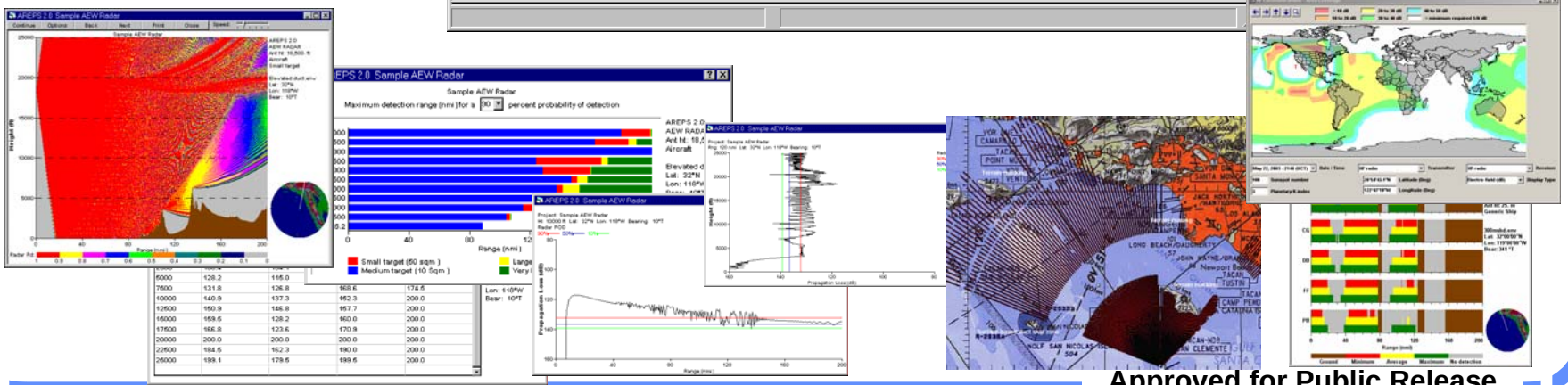


EM systems



Operator interface

Numerous decision aids



Approved for Public Release

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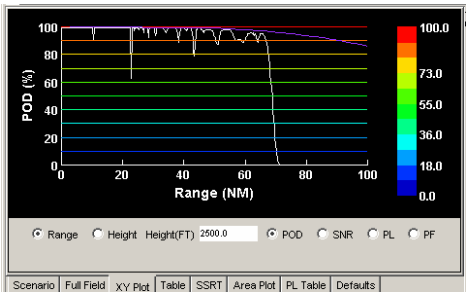
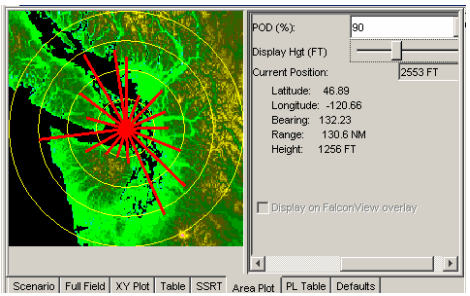
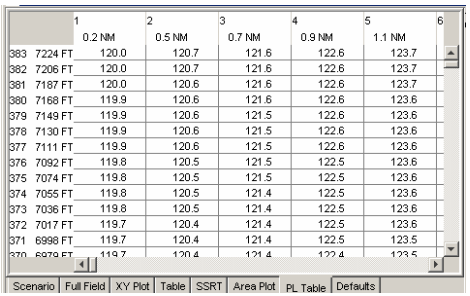
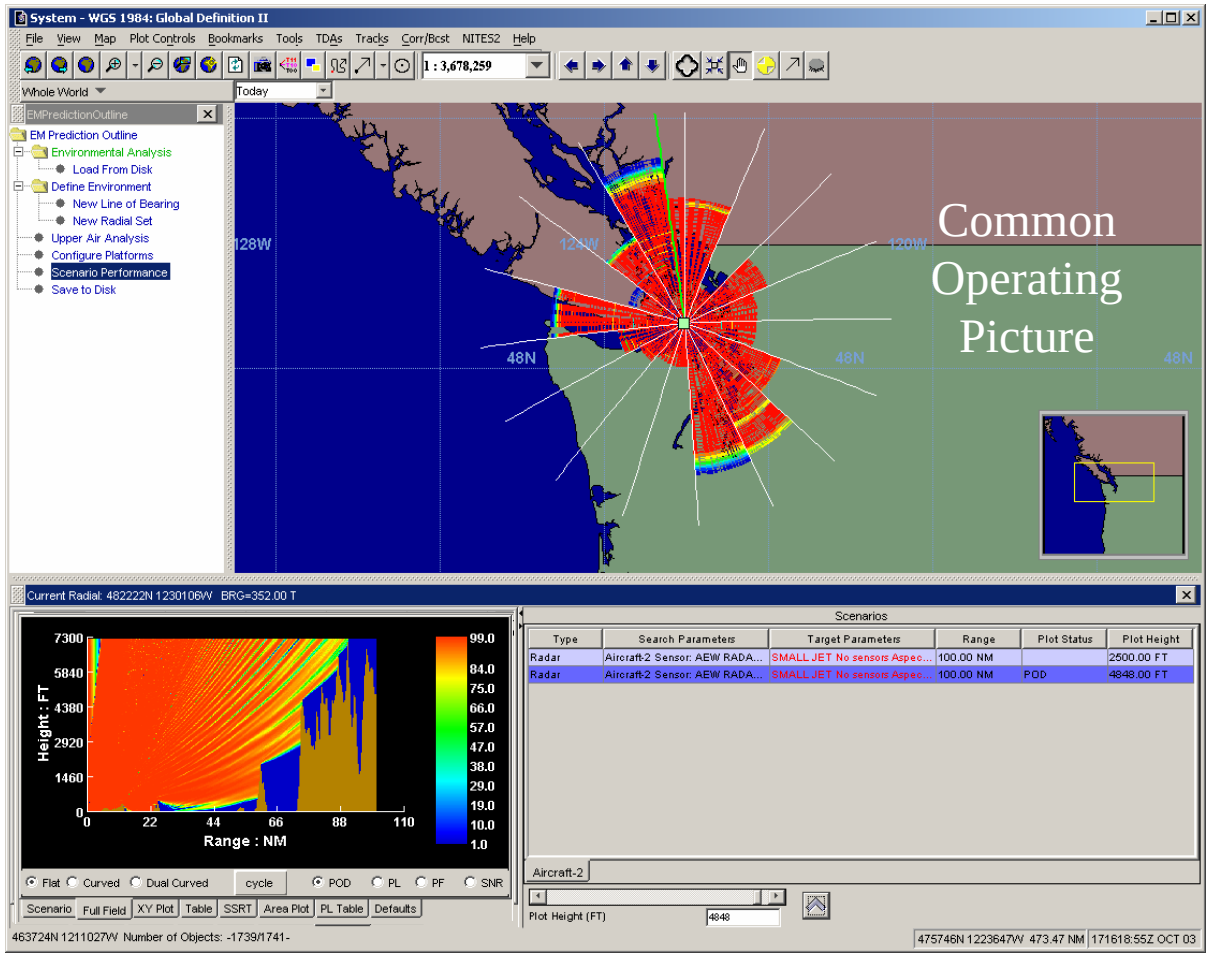
AREPS GCCS-M (NITES-II) Implementation









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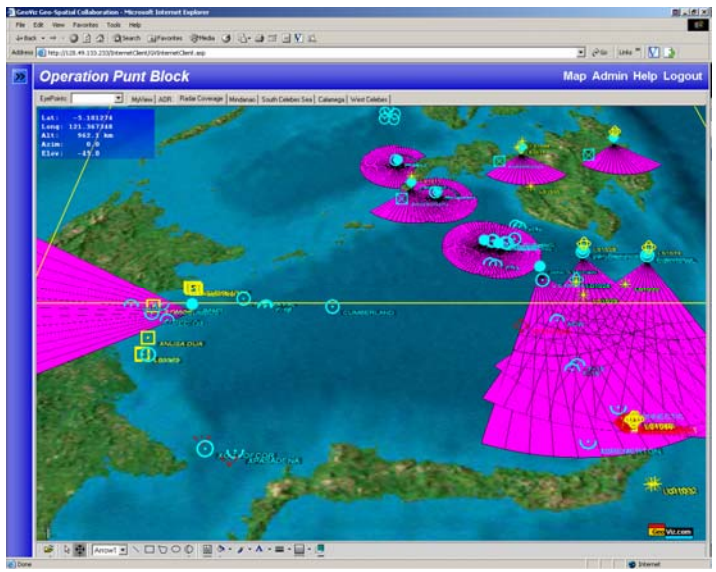
AREPS Server Mode

Composable ForceNet

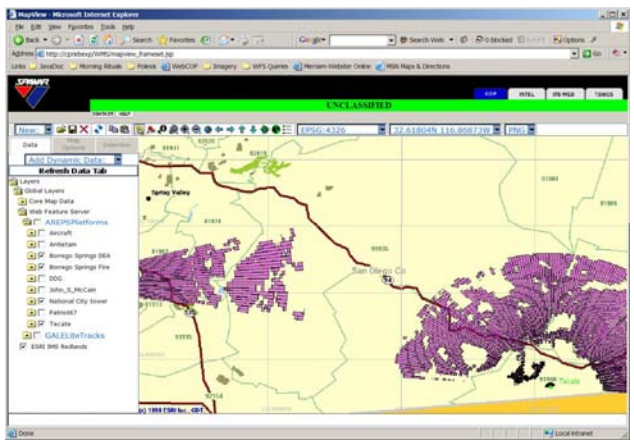
(Current Installs)

- CTF-74
- CTF-72
- CTF-72.2
- USS Blue Ridge



1. Runs on a background server
2. Uses COAMPS grid data from DAMPS
3. No AREPS operator intervention
4. Accessed via application GUI

Homeland Defense Proposal effort (SSC 246 Command and Control Technology and Experimentation Division)

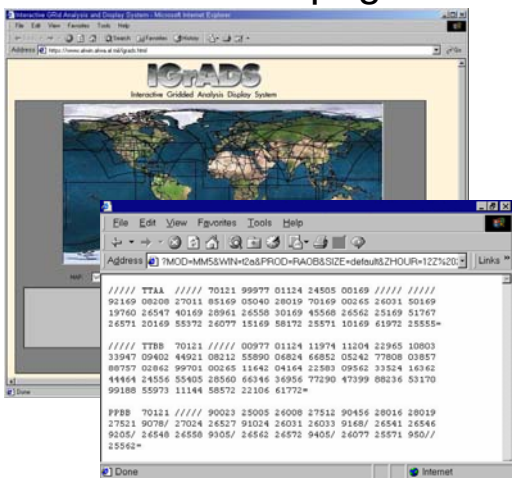


Emergency Response UHF communications East County San Diego

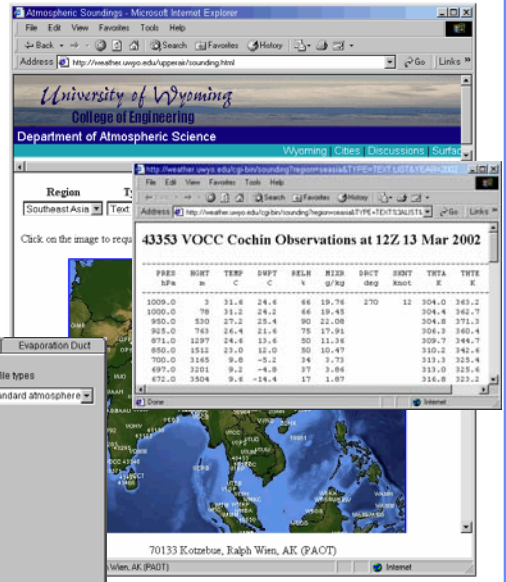
Numerous Environment Data Sources

- WMO Code
- Climatology
- Metcast/JMV
- Custom Columns
- TEDS
- COAMPS / MM5

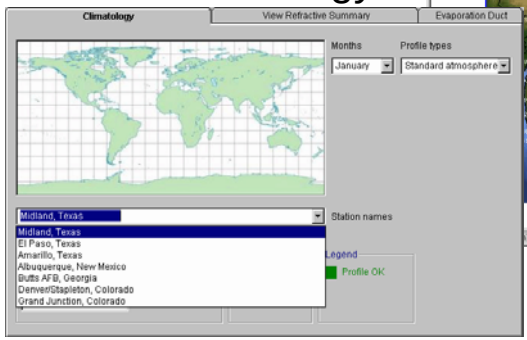
JAAWIN Homepage



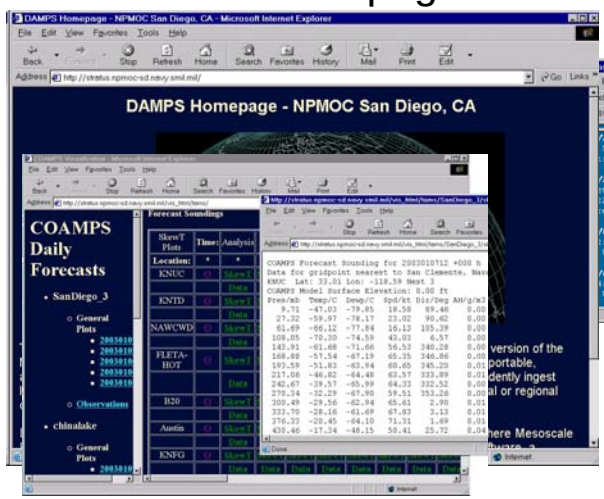
Civilian Homepages



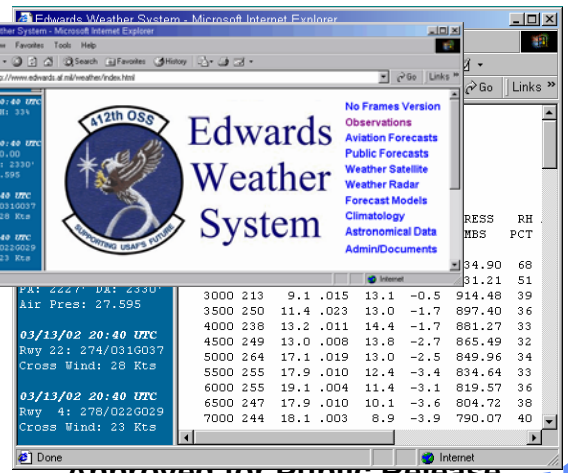
Climatology



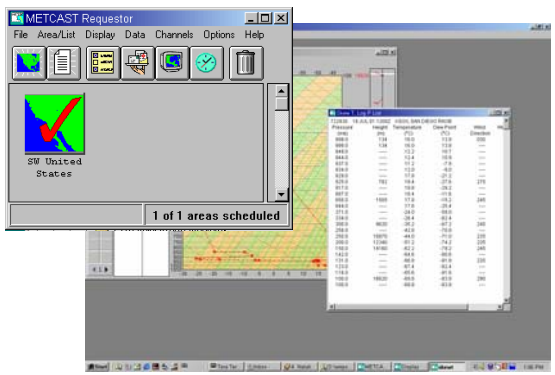
DAMPS Homepage



DoD Homepages



Metcast / JMV



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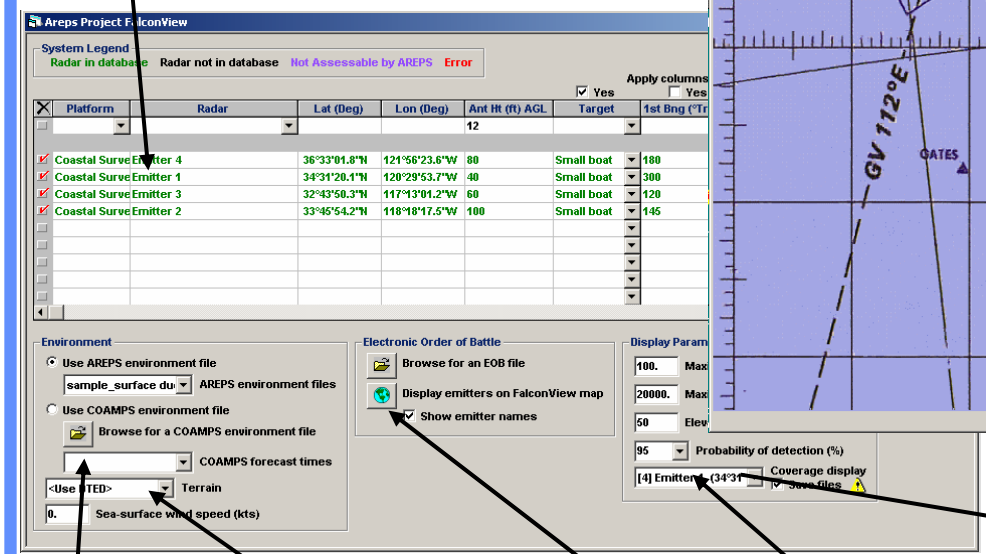
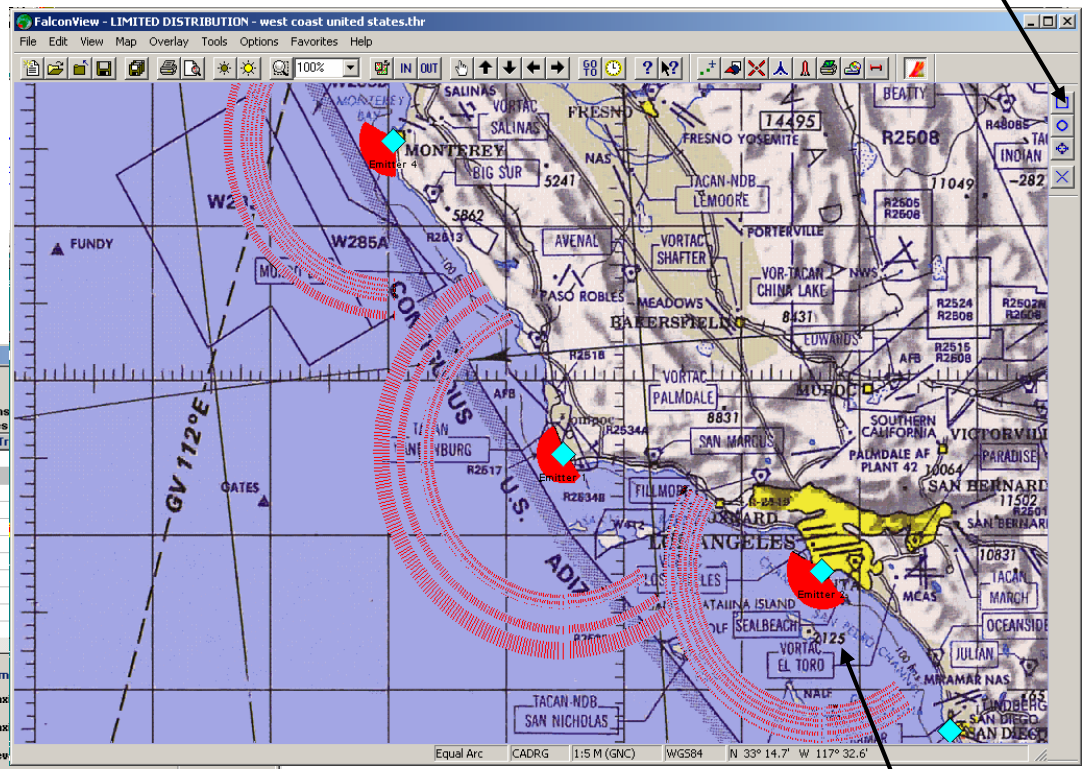
Special Application AREPS FalconView Interface

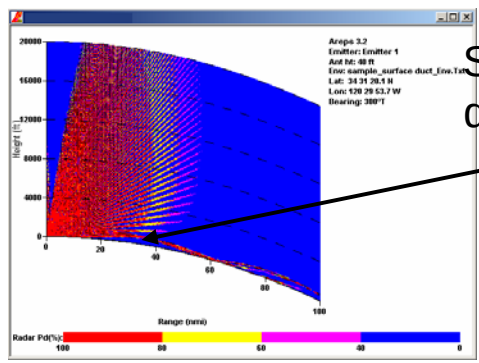
AREPS toolbar

FalconView display

Multiple emitters







DTED terrain

Import various EOB files

All normal AREPS displays

Surface-based duct skip-zone

Range & bearing environment data

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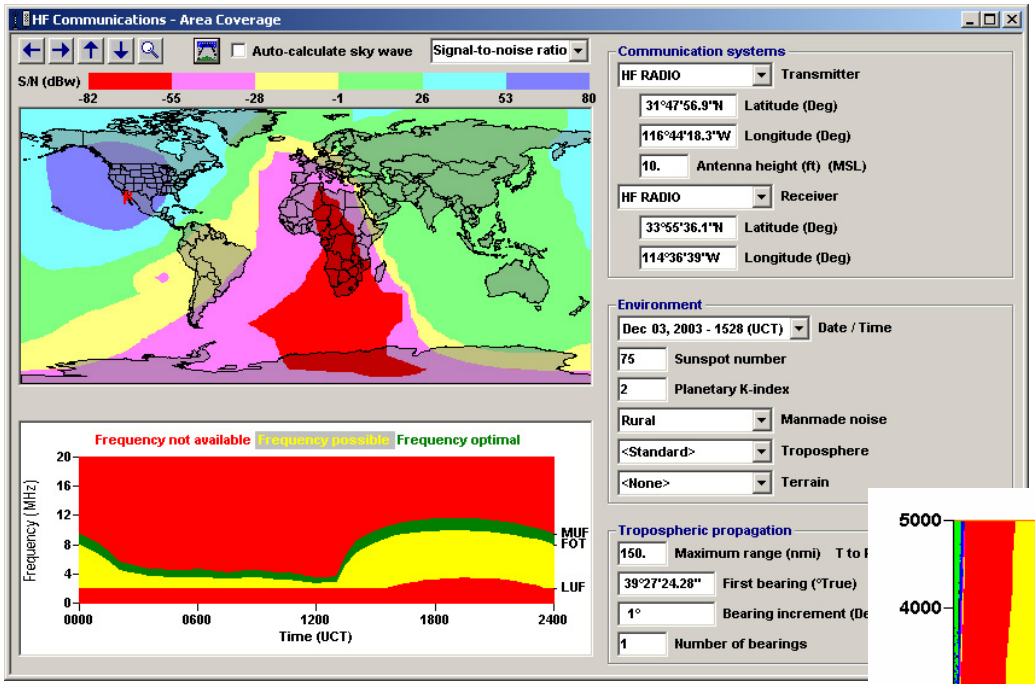
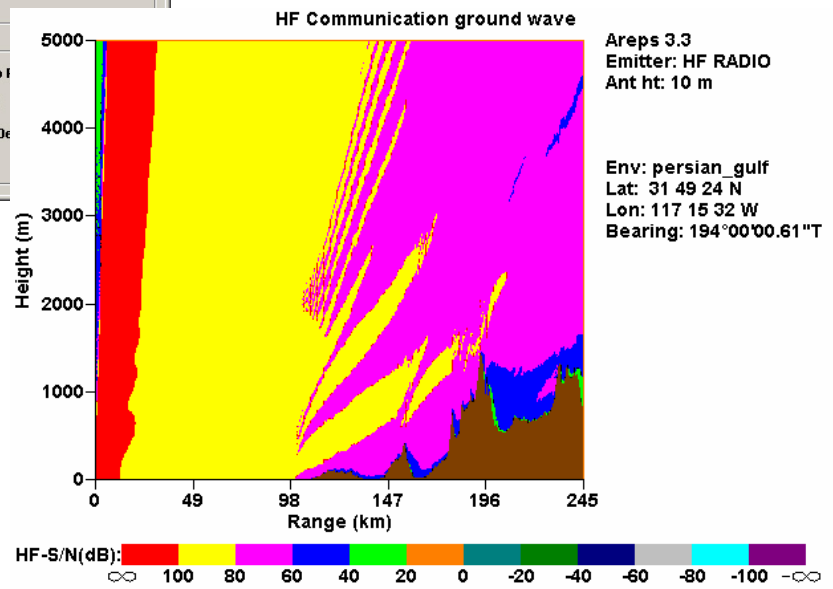
HF communications



- Used to assess HF sky-wave in both area and point-to-point display
- Used to assess HF combined sky-wave and ground-wave
- Propagation loss, electric field, signal-to-noise, received power, MUF,LUF,FOT, terrain masking.



- Reads environment from a file created with the environment program and ionospheric data obtained via AREPS homepage.
- Reads terrain from DTED or a custom file.

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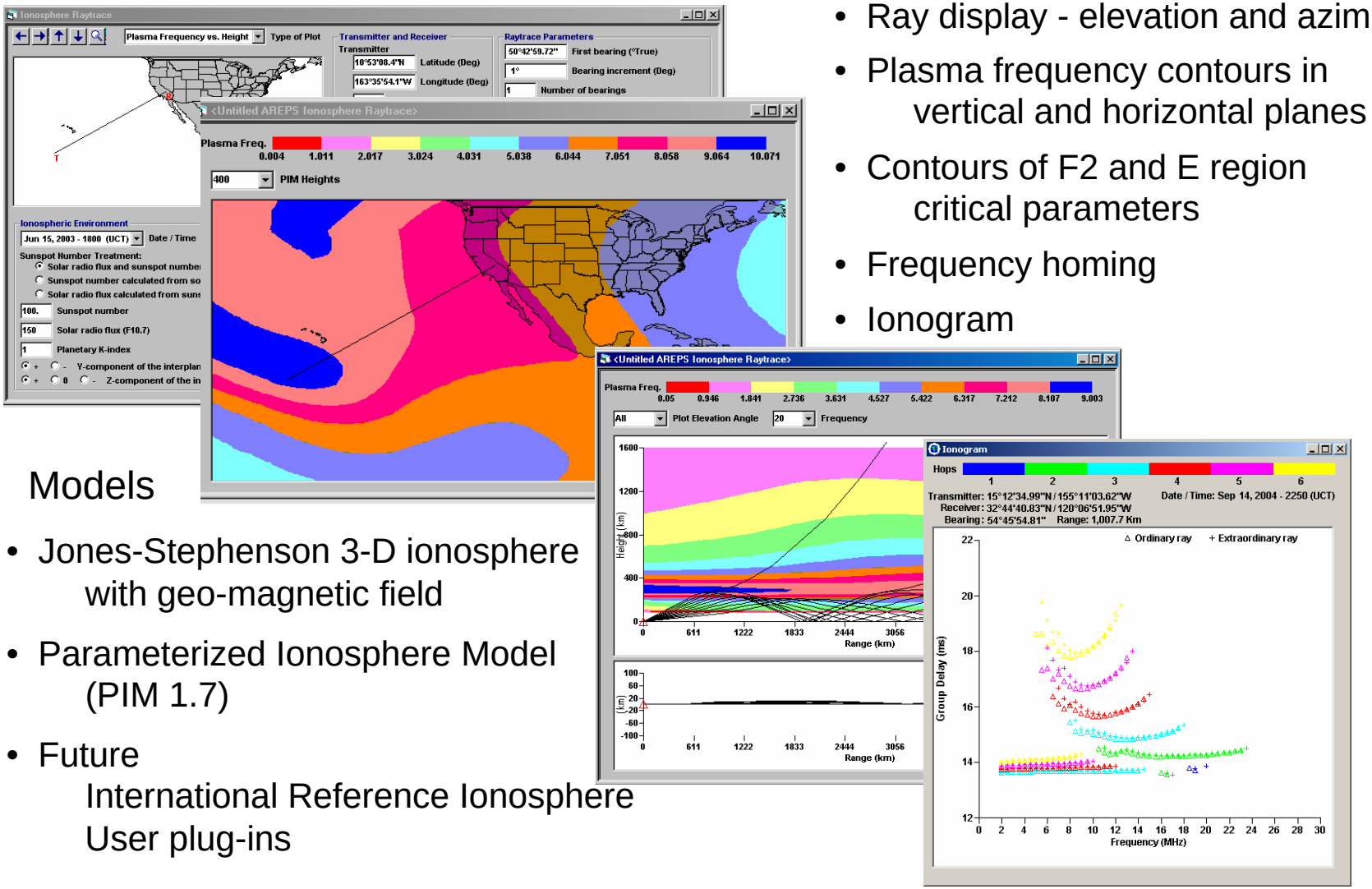
HF Ionosphere Raytrace Communications & Radar

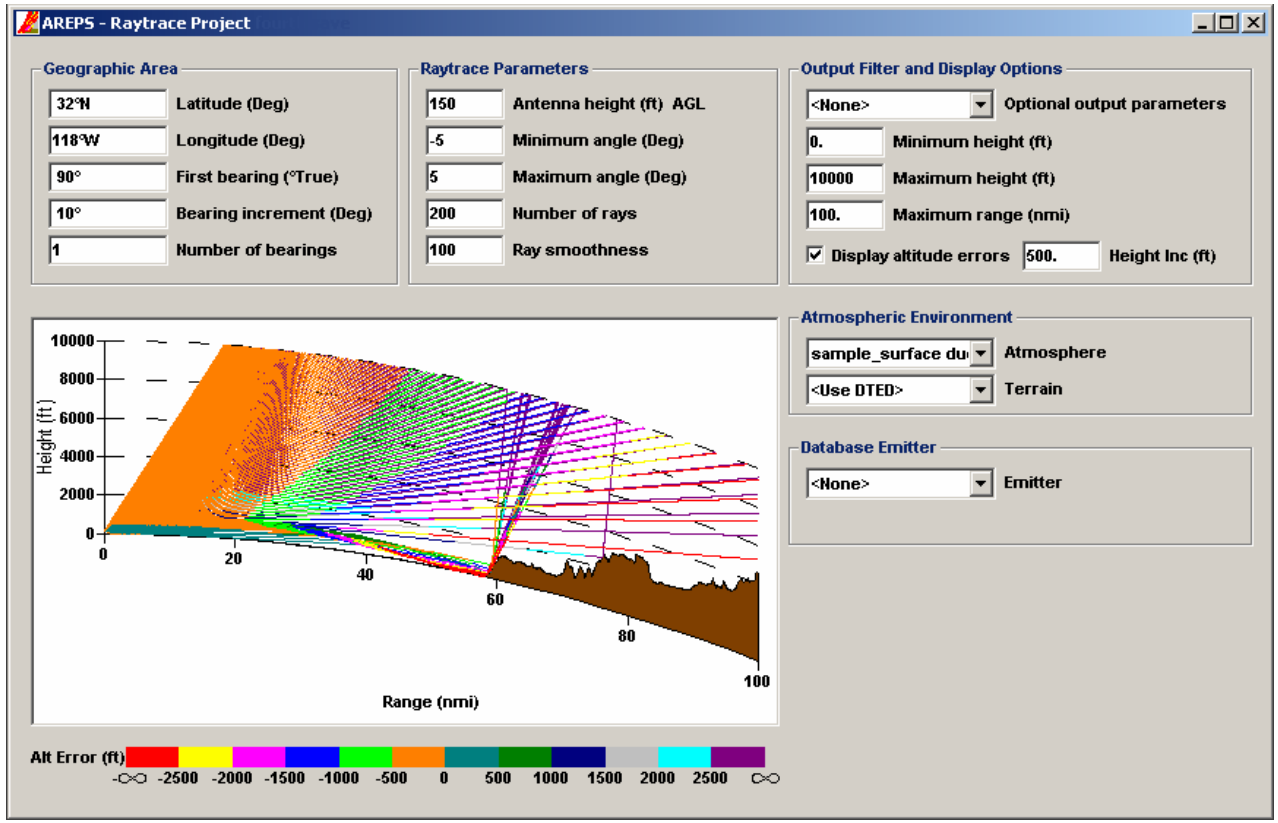
- Multiple azimuths, elevations, and frequencies
- Ray display - elevation and azimuth
- Plasma frequency contours in vertical and horizontal planes
- Contours of F2 and E region critical parameters
- Frequency homing
- Ionogram

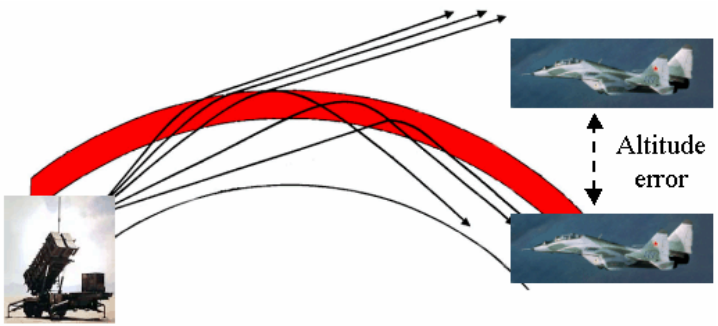


Models

- Jones-Stephenson 3-D ionosphere with geo-magnetic field
- Parameterized Ionosphere Model (PIM 1.7)
- Future
  - International Reference Ionosphere
  - User plug-ins

Troposphere Raytrace





- DTED data
- Altitude errors
- Range / bearing dependent atmosphere
- Optional internal data output - angles, ranges, heights, times, etc.

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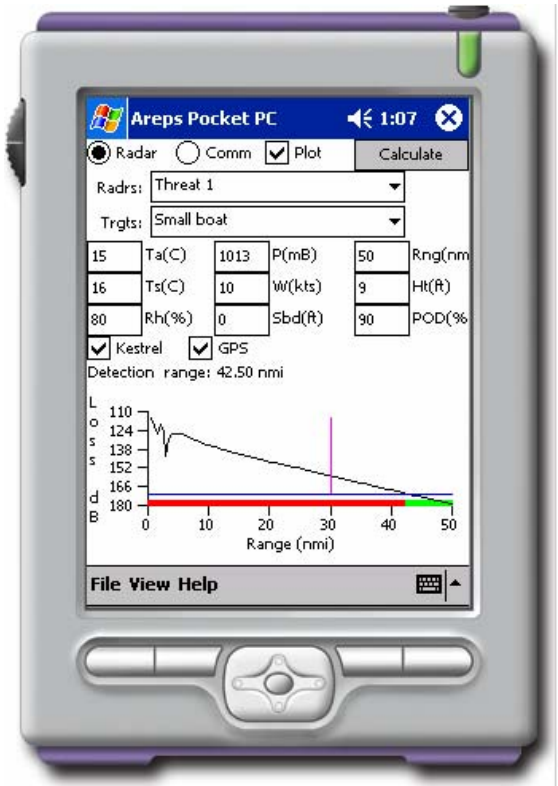
Special Application - AREPS Pocket PC



Kestrel Weather Sensor

Objective:

Provide an electro-magentic detection / counter detection capability in a small but robust hardware suite that will utilize real-time data such as wind, temperature, humidity and sea-surface temperature

Result:

- Radar probability of detection
- UHF/VHF communication assessment
- Standard (Ffactor) propagation model
- Naval Postgraduate School evaporation duct model
- Specification of surface-based duct
- Full AREPS EM system database
- Plug-in Kestrel weather sensor for automatic updates of surface environment conditions
- Plug-in GPS receiver to indicate current distance from emitter.
- On-line (html format) help